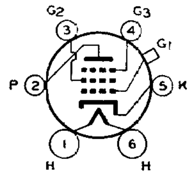


RCA-77

TRIPLE-GRID DETECTOR AMPLIFIER



The 77 is a triple-grid tube recommended especially for service as a biased detector in radio receivers designed for its characteristics. In such service, this tube is capable of delivering a large audio-frequency output voltage with relatively small input voltage. Other applications of the 77 include its use as a low-signal-input screen-grid amplifier tube and as an automatic-volume-control tube.

CHARACTERISTICS

HEATER VOLTAGE (A. C. or D. C.)		6.3	Volts
HEATER CURRENT		0.3	Ampere
PLATE VOLTAGE	100	250 *max.*	Volts
SCREEN VOLTAGE (Grid No. 2)	60	100 *max.*	Volts
GRID VOLTAGE* (Grid No. 1)	−1.5	−3	Volts
SUPPRESSOR (Grid No. 3)	Connected to cathode at socket		
PLATE CURRENT	1.7	2.3	Milliamperes
SCREEN CURRENT	0.4	0.5	Milliampere
PLATE RESISTANCE (Approximate)	0.65	1.5	Megohms
AMPLIFICATION FACTOR	715	1500	
TRANSCONDUCTANCE	1100	1250	Micromhos
GRID VOLTAGE (Approximate)†	−5.5	−7.5	Volts
GRID-PLATE CAPACITANCE (With shield-can)		0.007 *max.*	μμf
INPUT CAPACITANCE		4.7	μμf
OUTPUT CAPACITANCE		11.0	μμf
BULB			ST-12
CAP			Small Metal
BASE			Small 6-Pin

* The d-c resistance in the grid circuit should not exceed 1.0 megohm.
† For cathode current cut-off.

INSTALLATION

The base pins of the 77 fit the standard six-contact socket which may be installed to hold the tube in any position. For heater operation and cathode connection, refer to INSTALLATION under type 6A7. Shielding and screen voltage requirements are similar to those for the type 6C6.

APPLICATION

As a **radio-frequency amplifier pentode,** the 77 may be used particularly in applications where the r-f signal applied to the grid is relatively low, that is, of the order of a few volts. In such cases either screen or control grid voltage (or both) may be varied to control the receiver volume. When larger signals are involved, a super-control amplifier tube should be employed to prevent the occurrence of excessive cross-modulation and modulation-distortion. Recommended operating conditions for amplifier service are given under CHARACTERISTICS.

As a biased **detector,** the 77 is particularly recommended because of its ability to deliver a large audio-frequency output voltage of good quality with a fairly small radio-frequency signal input. Recommended conditions for the 77 as a biased detector are as follows:

PLATE SUPPLY*	100	250	250	Volts
SCREEN VOLTAGE	36	50	100*max.*	Volts
GRID VOLTAGE	−2	−2	−4.3	Volts
CATHODE RESISTOR	12500	3000	10000	Ohms
SUPPRESSOR	Connected to cathode at socket			
CATHODE CURRENT (No signal)	0.16	0.65	0.43	Milliampere
PLATE RESISTOR	0.25	0.25	0.50	Megohm
BLOCKING CONDENSER	0.01	0.03	0.03	μf
GRID RESISTOR†	0.25	0.25	0.25	Megohm
R-F SIGNAL (RMS)**	1.88	1.18	1.37	Volts

* Voltage at plate will be PLATE SUPPLY voltage minus voltage drop in plate resistor caused by plate current.

† For the following amplifier tube.

** With these signal voltages modulated 20%, the voltage output for the 100-volt plate supply is 14 peak volts at the grid of the following amplifier, a value sufficient to insure full audio output from a type 43; likewise for the 250-volt conditions, 17 peak volts, a value sufficient to insure full audio ouput from a type 2A5.

Detector bias may be obtained from a bleeder circuit, from a resistor in the cathode circuit, or from a partial self-bias circuit. The cathode-resistor method permits of higher output at lower percentage modulation since the input signal may be increased almost in inverse proportion to the modulation without resulting in objectionable distortion.

As an **audio-frequency amplifier pentode** in resistance-coupled circuits, the 77 may be operated as shown in the Resistance-Coupled Amplifier Section.

As an **audio-frequency amplifier triode,** the 77 should have its screen and suppressor connected to the plate. Operating conditions for triode service in transformer- or impedance-coupled circuits are: Plate voltage, 250 volts; grid voltage, −8 volts; and plate current, 8 milliamperes, approximate. If resistance coupling is used, a plate-supply voltage of 250 volts may be applied through a plate-coupling resistor of 0.1 to 0.25 megohm.

As a **mixer** in superheterodyne circuits, the 77 can be employed, but a tube having super-control characteristics is to be preferred, especially if signals of large magnitude are to be received, and if supplementary volume control is to be obtained in this stage.

AVERAGE PLATE CHARACTERISTICS

